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1. INTRODUCTION

This Attachment was prepared in support of Excelsior Mining Arizona, Inc.'s (Excelsior's) Underground Injection Control (UIC) Permit application to the United States Environmental Protection Agency (USEPA). Excelsior is applying for an area Class III UIC permit to install a wellfield for in-situ recovery (ISR) of copper at the Gunnison Copper Project (Project), located in Cochise County, Arizona.

This attachment is a Contingency Plan. It is based on the Emergency Response and Contingency Plan submitted to the Arizona Department of Environmental Quality (ADEQ) in support of an Aquifer Protection Permit (APP) application for the same project. In the interest of efficient permit compliance, some of the contingencies included herein are not strictly related to well failures. However, they are elements of good operating practices, and are therefore included.

This contingency plan was prepared to define actions that will be taken in response to the following conditions:

- Loss of hydraulic control
- Well failures
- Operational Noncompliance
- Water quality exceedances at Point of Compliance (POC) wells

Monitoring of hydraulic control, mechanical integrity, and water quality will be conducted according to Attachment P of the UIC Permit. Water quality monitoring will also be conducted according to an Aquifer Protection Permit (APP) to be issued by ADEQ. In order to simplify groundwater monitoring requirements, contingencies for alert level (AL) exceedances proposed in this attachment are the same as those that are proposed under Excelsior's APP Application.

At least one copy of this plan will be maintained at the location where day-to-day decisions regarding the operation of the facilities are made. All employees responsible for the operation of the facility must be made aware of the location of this plan. This plan addresses requirements under the UIC permit to be issued by USEPA. Other regulatory procedures for releases may apply.

This contingency plan will be updated after the UIC permit is issued to ensure that it is consistent with the terms of the permit.

2. CONTINGENCY PLAN ELEMENTS

2.1 Loss of Hydraulic Control

Loss of hydraulic control may have occurred if fluid levels in the observation wells do not show an inward hydraulic gradient towards the wellfield. Loss of hydraulic control does not mean that an excursion of solutions from the wellfield has occurred.

~~Excelsior will initiate the following actions within 24 hours of becoming aware of possible loss of hydraulic control:~~

~~If an Alert Level for hydraulic gradient is exceeded at observation wells adjacent to hydraulic control wells, the Permittee shall take the following actions:~~

- ~~1. Obtain manual water level measurements from the observation well pair to confirm the AL exceedance.~~
 - ~~2. Notify the EPA within five days of confirming the AL exceedance.~~
 - ~~3. If the AL is not confirmed, the Permittee shall notify EPA of the results. No further action is required until the next monitoring round.~~
 - ~~4. If the AL is confirmed, the Permittee shall adjust the flow rate from the associated hydraulic control well (or additional hydraulic control wells) so as to increase the hydraulic gradient observed in the observation well pair to meet the permit requirements.~~
 - ~~5. The Permittee shall no longer be considered in exceedance once inward hydraulic gradient is reestablished and demonstrated.~~
- ~~• Evaluate the pumping rate in the nearest hydraulic control well(s).~~
 - ~~• Adjust pumping rates to restore hydraulic control, as indicated by water levels in the observation well pairs.~~
 - ~~• If a sufficient pumping rate cannot be achieved and maintained to restore an inward gradient, perform any operational, repair, and/or maintenance actions required to achieve the necessary pumping rate.~~
 - ~~• Adjust pumping rates such that extraction/injection rates are balanced according to the permit conditions.~~
 - ~~• Adjust pumping rates such that wellfield injection volumes do not exceed wellfield extraction volumes based on a 30-day rolling average.~~

2.2 Well Failures

Well failures may occur because of the loss of mechanical integrity of a well or a failure in well equipment.

2.2.1 Mechanical Integrity

Well failure due to a loss of mechanical integrity may be identified by significant changes in injection pressure, injection flow rates, or recovery flow rates. In the event of suspected mechanical failure in an injection or recovery well, injection/recovery will be stopped as soon as possible using an isolation valve. Part 1 of the UIC mechanical integrity testing requirement will be addressed by the following method or another suitable method approved by ADEQ and USEPA: A packer will be installed immediately above the bottom of the cased interval, and the casing will be completely filled with water. A hydraulic pressure equal to or above the maximum allowable wellhead injection pressure will be applied. The test will be conducted for a minimum of 30 minutes. The well will be considered to have passed if there is less than a five (5) percent change in pressure during the 30-minute period. Part 1 Mechanical Integrity will be demonstrated before a Class III injection well is put into service, and every 5 years thereafter as long as the well is in use not plugged and abandoned (or any time the well might go back into use if it has not been tested in the prior 5 years), and when there is a reason to suspect well failure. ~~Part 1 mechanical integrity will be demonstrated before a Class III well is put into service and when there is reason to suspect a well failure.~~

If Part 1 testing indicates that mechanical integrity has not been demonstrated, a decision will be made to abandon or repair the well. If the decision is made to repair the well, USEPA and ADEQ will be notified within five business days and the well will be re-tested after the repairs are made. If the decision is made to abandon the well, a report will be submitted to ADEQ and USEPA in the next quarterly monitoring period. The abandonment and related reporting will proceed in accordance with the Plugging and Abandonment Plan (submitted as Attachment Q in the UIC application).

Part 2 mechanical integrity testing will be completed as part of the planned geophysical logging. As noted in Attachment I, Section 3.2, after well construction is complete, the well will be logged using the following borehole geophysical methods:

- Gamma
- Sonic (injection wells only)
- Temperature (all wells)
- Caliper
- ABI (Acoustic Borehole Image) or equivalent
- Cement bond logs (only on wells with steel casing) for Part 2 Mechanical Integrity.
- Directional survey

The temperature logs will meet the Part 2 mechanical integrity requirement for wells constructed with PVC and/or FRP materials. The cement bond log will meet the Part 2 mechanical integrity requirement for wells with steel casing.

~~Part 2 mechanical integrity testing addresses vertical channels adjacent to the well bore; it will not be conducted because the basin fill that overlies the injection zone is not an USDW.~~

2.2.2 Well Equipment Failure

Well equipment failure (including electrical or mechanical breakdown of pumps, gages, valves, or other well appurtenances) will be evaluated as it is detected. In-plant maintenance orders will be issued and tracked to ensure timely repair. Excelsior will maintain an adequate inventory of replacement parts to maintain well equipment in proper working order. Such failures and related responses are considered part of normal operations.

Any failure in an observation well and/or a hydraulic control well that affects the ability to maintain and observe hydraulic control will be repaired as soon as possible. In the event that well equipment failure resulted in a possible loss of hydraulic control (as described in Section 2.1) or water quality exceedances at a POC (as described in Section 2.4), contingencies for those conditions will apply.

In the event of well equipment failure in an injection or recovery well, injection/recovery from the well will be stopped as soon as practicable using an isolation valve. The wellfield operation will be adjusted to balance the pumping/injection rates.

2.3 Operational Noncompliance

Noncompliance with operational requirements of the permit will be corrected as soon as the condition is identified. The corrective measures may include:

- Adjusting injection/recovery volumes
- Adjusting injection pressure
- Isolating the well until the problem can be properly diagnosed and repaired.

The wellfield will be operated in compliance with the injection pressures and volumes specified in the permit. The total injection, production, and hydraulic control volumes will be monitored and recorded daily. The ~~30 day rolling~~48-hour average of the combined pumping volumes from recovery wells and hydraulic control wells will exceed the ~~30 day rolling~~48-hour average of the total injection volume. Should the ~~30 day rolling~~48-hour average of injection volume exceed the pumping volume, upon becoming aware of this condition, Excelsior will adjust injection/recovery rates such that the ~~30 day rolling~~48-hour average will show net pumping within the next ~~30 days~~24 hours. Excelsior will operate in this way for the first 60 days of operations after which Excelsior will evaluate collected data to determine if a longer averaging period is as protective as the 48-hour period.

Excelsior will report, within 24 hours of becoming aware of it, any noncompliance with wellfield operations. The notification will initially be provided orally, followed by a report describing the noncompliance, its cause, the period of noncompliance, and the time frame and steps for corrective actions. A follow-up report will be submitted within five days of becoming aware of the noncompliance.

2.4 Water Quality Exceedances at Point of Compliance Wells

Excelsior proposes that the UIC permit include the following contingencies for water quality exceedances at POC wells for the wellfield¹:

2.4.1 Exceeding Alert Levels Parameters in POC Wells

The following protocol will be implemented when an AL at a POC well is exceeded.

- 1) If an AL is exceeded, verification sampling may be conducted. Verification sampling, if conducted, will be conducted within 5 days of becoming aware of an AL being exceeded. The results of another sample taken between the date of the last sampling event and the date of receiving the result may be used as verification.
- 2) If verification sampling confirms the AL being exceeded, or if Excelsior opts not to perform verification sampling, then the groundwater monitoring frequency will be increased to monthly. In addition, Excelsior will immediately initiate an investigation of the cause of the AL being exceeded, including inspection of all discharging units and all related pollution control devices, review of any operational and maintenance practices that might have resulted in an unexpected discharge, and hydrologic review of groundwater conditions including upgradient water quality.
- 3) Excelsior will initiate actions to resolve any problems identified by the investigation which may have led to an AL being exceeded. To implement any other corrective action the permittee shall obtain prior approval from USEPA and ADEQ. Subject to written approval by USEPA, Excelsior may submit, as an alternative to the above-referenced investigation, a technical demonstration, that although an AL is exceeded, pollutants are not reasonably expected to cause a violation of an AQL. The demonstration may propose a revised AL or monitoring frequency for approval in writing by USEPA.
- 4) Within 30 days after confirmation of an AL being exceeded, Excelsior will submit the laboratory results to the USEPA and ADEQ along with a summary of the findings of the investigation, the cause of the AL being exceeded, and actions taken to resolve the problem.

¹ Under the APP, there will be additional POC wells for permitted impoundments. Monitoring results from these wells will not be reported to USEPA, as they are not appropriately located or constructed to monitor wellfield impacts.

Comment [RG1]: Does this match APP?

YES

- 5) Upon review of the submitted report, the USEPA may amend the UIC permit to require additional monitoring, increased frequency of monitoring, or other actions.
- 6) The increased monitoring required as a result of ALs being exceeded may be reduced to the regularly scheduled frequency, if the results of three (3) consecutive monthly sequential sampling events demonstrate that no parameters exceed the AL.
- 7) If the increased monitoring required because of an AL exceedance continues for more than six sequential sampling events, the permittee shall submit a second report documenting an investigation of the continued AL exceedance within 30 days of the receipt of laboratory results of the sixth sampling event.

Comment [RG2]: Matches APP--AJ

2.4.2 Exceeding Aquifer Quality Limits at a POC Well

The following protocol will be implemented when an AQL at a POC well is exceeded:

- 1) If an AQL is exceeded, verification sampling is allowed. If Excelsior opts to conduct verification sampling, will be conducted within 5 days of becoming aware of an AQL being exceeded. The results of another sample taken between the date of the last sampling event and the date of receiving the result may be used as verification.
- 2) If verification sampling confirms that the AQL is violated for any parameter, or if the verification sampling is not conducted, then the frequency of monitoring will be increased to monthly. In addition, an evaluation will be initiated immediately to (a) identify the cause of the violation, (b) inspect of all discharging units and all related pollution control devices, and (c) review of operational and maintenance practices that might have resulted in unexpected discharge.
- 3) A report, which includes a summary of the findings of the investigation, the cause of the violation, and actions taken to resolve the problem will be prepared and submitted to USEPA. A verified exceedance of an AQL will be considered a violation unless it is demonstrated within 90 days, or a longer time period if agreed to by USEPA, that the exceedance was not caused or contributed to by pollutants discharged from the facility.
- 4) Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.
- 5) Notify any downstream or downgradient users who may be directly affected by the discharge.

3. REPORTING REQUIREMENTS

3.1 Hydraulic Control

Responses to loss of hydraulic control will be described in Section 2.1. Reporting of actions taken in response to loss of hydraulic control will be included in the next quarterly report that is submitted to USEPA. The permittee will describe the causes and impacts of the loss of hydraulic control and the actions that were taken to correct the event.

3.2 Mechanical Integrity

The following language is proposed for reporting loss of mechanical integrity:

The permittee shall notify USEPA under any of the following circumstances:

- i. A well fails to demonstrate mechanical integrity during a test, or*
- ii. A loss of mechanical integrity becomes evident during operation, or*
- iii. A significant change in the injection pressure and/or rate occurs during normal operating conditions.*

Furthermore, for new Class III wells, injections shall not commence and for operating wells, injections shall be terminated and may not resume, until the permittee has taken necessary actions to restore integrity to the well and has demonstrated that the well has integrity.

3.3 Operational Noncompliance

Excelsior will report, within 24 hours of becoming aware of it, any noncompliance with wellfield operations if the noncompliance could result in fluid migration into or between underground sources of drinking water. The notification will be initially be provided orally, followed by a report describing the noncompliance, its cause, the period of noncompliance, and the time frame and steps for corrective actions. A follow-up report will be submitted within five days of becoming aware of the noncompliance.

3.4 Water Quality Alert Level Exceedances

Proposed reporting requirements for AL exceedances are included in Section 2.4. These response and reporting requirements are standard in APPs issued by ADEQ.

